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Wage inequality in a developing open economy: Portugal, 1944–1984

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This paper estimates and analyses wage inequality trends in Portugal, from 1944 to 1984, a period that comprises the Estado Novo dictatorship and the first decade after the transition to democracy. Wage inequality is measured by the gap between skilled and unskilled labour, and reveals a downward trend in most of the period in analysis. We provide an explanation for the observed trends by looking at the influence of domestic and international forces on changes in the relative supply and demand of skilled labour. According to our findings, the skill premium declined due to the combined influence of two major forces: an increase in the relative supply of skilled labour due to the mass emigration of unskilled labour, and the decrease in the relative demand for skills, related to trade-induced changes stemming from the country's increasing openness, which followed the country's unskilled labour comparative advantages. Our findings point to the conclusion that the impact of openness on wage inequality is related to the country's relative level of development among its major trading partners.

Keywords: wage inequality; economic growth; structural change; international trade; Portugal

1. Introduction

The study of the relationship between market forces and (wage) inequality trends has a long and well-established tradition in the economic literature. Within this literature, an important stream of research has examined the role played by international commodity market integration and mass migration on the convergence between Old and New Worlds during the late nineteenth and early twentieth centuries – the first globalisation boom – and on the reversion of these patterns during the interwar period.¹ Using evidence on wage-rental and wage-productivity ratios, it has been generally found that open economy forces had a large impact on inequality trends, explaining most of the convergence between the late nineteenth and early twentieth centuries, when the returns to labour decreased relative to land and other factors in the land-abundant countries of the New World, and increased in the labour-abundant countries of the Old World. The slowing down of convergence in the

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¹See, for example, O'Rourke et al., 'Factor Price' (1996); Williamson, 'Globalization and Inequality' (1997); Taylor/Williamson, 'Convergence' (1997).

interwar period is also attributed to the overall movement of 'deglobalisation', with the rise in trade barriers and the imposition of quotas and other barriers to migration, which would explain the rise in wage-rental and wage-productivity ratios in the Old World and its fall in the New World.

The debate on the impact of globalisation on inequality has also flourished in the 1990s, following the outbreak of the second globalisation boom.² In these latter studies, focus is brought to bear on the distinction between North and South (industrial vs. developing countries), instead of the historical Old World/New World dichotomy, and a change is also made with respect to the inequality measure used, which is now based on the computation of skilled–unskilled wage ratios.

Using this latter measure of inequality, Anderson has reassessed the impact of globalisation on wage inequality prior to 1970, considering a sample of eight now-developed countries, and finding some results which are at odds with the general evidence stemming from the 'historical' debate.³ According to Anderson's findings, the main factors influencing trends in wage inequality are found in domestic forces – expansion of education, growth of new skill-intensive industries and fluctuations in the level of aggregate demand. The three domestic factors, common to both the New World and Old World countries, would explain most of the fall in wage inequality within countries after 1914, whereas globalisation had a minor impact, largely confined to the pre-1914 period.

The result that domestic factors were the fundamental sources of wage inequality trends during most of the twentieth century is also found in a number of single country studies focusing on developed countries' experiences, most notably the USA.⁴ There is, however, some controversy on the matter, with some late twentieth-century critics of the technology thesis emphasising instead the role played by globalisation in the process.⁵

In this paper, we analyse the role played by international vs. domestic forces in a country which, although broadly included within the 'Old World' categorisation, differed in many relevant aspects from the Old World benchmark. Unlike the Old World countries included in Anderson's study, which were European industrial leaders (Britain, France, Germany) or early latecomers to economic modernity (Sweden and Denmark), Portugal was unable to revolutionise its agriculture during the nineteenth century, remaining as a backward, resource-poor, labour-abundant agrarian economy during the first half of the twentieth century. Moreover, education and literacy in Portugal remained among the lowest in Western Europe during the nineteenth and twentieth centuries, which is in clear contrast with other Old World countries' records.⁶

The period under analysis, from 1944 to 1984, broadly an epoch characterised by rapid growth, economic convergence and globalisation,⁷ covers most of the *Estado*

²See Wood, *North-South Trade* (1994); Leamer, 'Trade' (1994); Richardson, 'Income Inequality' (1995); Robbins, 'HOS Hits Facts' (1996).

³Anderson, 'Globalization' (2001).

⁴Goldin/Katz, 'Decline of Non-competing' (1995); Goldin/Katz 'Origins of Technology' (1998); Katz/Murphy, 'Changes' (1992); Autor et al., 'Trends' (2008).

⁵See, for example, Wood, *North-South Trade* (1994); Wood, 'Globalisation' (1998); Borjas/Ramey, 'Time Series Evidence' (1994).

⁶Tortella, 'Patterns' (1994).

⁷Williamson, 'Globalization' (1997).

Novo ('New State') dictatorship and the first decade following Portugal's transition to democracy in 1974. From a comparative point of view, the transformations in Portugal during this period, which was marked by the transition from a backward, protectionist, agriculture-based economy to an industrial and service 'free-trade' economy, raise important issues. A specific point that this paper highlights regards the relationship between wage inequality and changes in economic variables. Were domestic forces, as in Anderson's study, more important than international forces as determinants of wage inequality, or is the order of factors reversed when a relatively backward and illiterate economy is considered?

As in Anderson's study, and in line with recent developments in the literature on wage inequality,⁸ we undertake an analysis of inequality trends based on the changes taking place in the relative supply and the relative demand of skills. Although this literature focuses on a more contemporary period – studies produced in this area are generally based on the analysis of wage inequality trends in developed countries after the 1980s – and for that reason relies on a much vaster amount of data, the basic framework can still be used to get an indication of the primary forces involved in wage inequality patterns over wider time intervals. One advantage of looking at Portugal is that Portuguese data sources allow for a detailed analysis of wage inequality trends in these terms, looking at the entire wage distribution and not only to the top fractiles.⁹ As explained in more detail in Appendix 1, the Portuguese Statistical Office (INE) provides data on wages and workers across occupations, broadly distinguishing between employees (workers with directive responsibilities, technicians and administrative personnel), and workers who participate directly in the production process, which constitute the basis for our classification of skilled and unskilled labour used in the computation of wage inequality. Thus, the paper provides an explanation for the inequality trends observed, considering the influence of both domestic and international forces on changes in the supply and demand of skilled relative to unskilled labour, and tries to estimate what was more important in the Portuguese case. In doing so, we assume that wages are essentially an expression of both supply and demand, considering that the institutional arrangements discussed in the paper that affected wage setting did not fundamentally change the course of economic events throughout the period under study.

The paper is structured as follows. Section 2 gives an account of the institutional and macroeconomic background of the period under study. Section 3 describes the overall trends in wage inequality, focusing on the relative wage of skilled labour. Section 4 examines the impact of supply and demand-side factors influencing the relative supply of and the relative demand for skilled labour, respectively. A final section discusses the findings of the paper in relation to previous evidence on Portuguese and other countries' inequality trends during the period under study.

⁸Katz/Murphy, 'Changes' (1992); Card/Lemieux, 'Falling Supply' (2001); Autor et al., 'Trends' (2008).

⁹Despite the fact that many historical studies focusing on inequality are based on top income shares [e.g., Atkinson/Piketty, *Top Incomes* (2007); Leigh/van der Eng, 'Inequality' (2009); Alvaredo, 'Top Incomes' (2009)], the use of the entire wage distribution provides a more comprehensive picture of inequality changes, since it takes into account the lower and middle parts of this distribution, and not just the top incomes.

2. The period of *Estado Novo* in Portugal and the transition to democracy

The period under study comprises 30 years of the *Estado Novo* dictatorial regime, between 1944 and 1974, and the first decade after democracy has been installed, following the ‘armed forces’ revolution.¹⁰ The authoritarian regime had its origins in a military coup in 1926, being institutionalised after Oliveira Salazar became Prime Minister in 1932, and a political constitution was approved by a rogue plebiscite in the following year. In political terms, the *Estado Novo* period was one of institutional continuity. Salazar did not allow any kind of softening of the regime during his enduring autocracy, characterised by a corporatist organisation of the economy which combined extensive state regulation with predominantly private property of the means of production.¹¹ Under this system, social conflict and competition were strongly restrained by means of close regulation. In the labour market, in particular, employers and workers were organised in guilds (*grémios*) and trade unions, respectively. Trade unions were fully controlled by the government, strikes were forbidden and collective bargaining agreements reached among trade unions and employers’ representatives required government approval in order to become effective. The government exerted strong authority over wages, which were kept at relatively low levels in order to prevent inflation.¹² During the later *Estado Novo* period, however, wages increased significantly, responding to the acceleration of economic growth and to the significant outflow of workers (cf. Figure 1).¹³

Education was a highly selective system favouring the middle and upper classes. Literacy rates were substantially below European average levels: 41% in 1930 and 62% in 1960.¹⁴ Significant investments in human capital were not made before the 1950s. In the 1960s, the government made public education available for all children between the ages of 6 and 12, but even then the number of individuals with secondary and tertiary degrees remained extremely low by international standards (cf. Table 1). Moreover, and despite some important steps made in the construction of a welfare state during the *Estado Novo* period,¹⁵ only a minor fraction of the population was subjected to income taxation, which determined a very low impact of progressive taxation over the income distribution.¹⁶

Salazar left power in 1968, due to a bad health condition and died in 1970. His successor – Marcelo Caetano – introduced some changes and a mild reformist period began, although the margin for change was considerably small due to the continuation of the African colonial wars, started in 1961. The regime came to an

¹⁰ Although it would be worthwhile studying the whole period of *Estado Novo*, including the earlier years, such an effort could not be undertaken due to data constraints: the decomposition of labour by skill content is only available from 1944 onwards.

¹¹ See Lucena, *Evolução do Sistema Corporativo* (1976) for a comprehensive study on Portugal’s authoritarian model.

¹² Marques, *Política Económica* (1988); Lopes, *Economia Portuguesa* (1996).

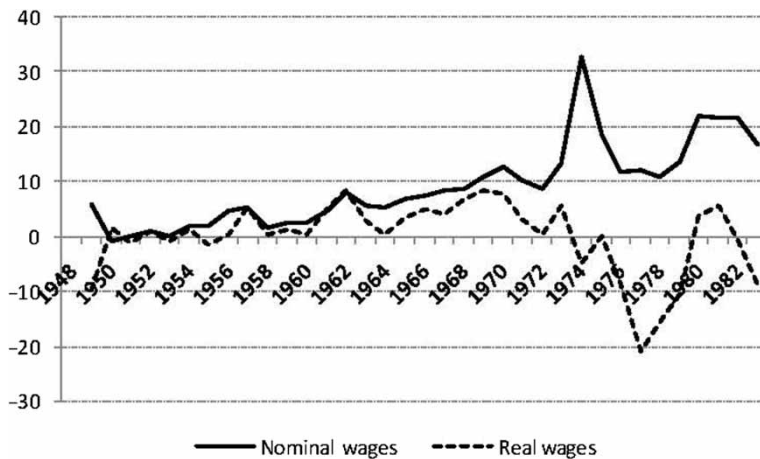
¹³ According to Baganha, ‘Closed to Open Doors’ (2003), the number of emigrants in the last decade of the dictatorial regime was of about 1.3 million (legal and illegal emigration), an impressive figure which may in fact underestimate the actual outflow of people, given the difficulties in assessing the size of clandestine emigration.

¹⁴ Tortella, ‘Patterns’ (1994).

¹⁵ Pereirinha/Carolo, ‘Construção Estado-providência’ (2009).

¹⁶ This raises some problems in estimating inequality trends on the basis of tax data, as done in Alvaredo ‘Top Incomes’ (2009) and Guilera’s ‘Evolution of Top Income’ (2010) studies.

Figure 1. Annual growth rates of nominal and real industry wages (%).



Note: Own computations based on wage and price indices data from Valerio et al. (2001).

end in 1974 with another military coup, known as the ‘Carnation Revolution’. The centre-stage of the political scene in the political and social turmoil of the immediate post-Caetano period was occupied by a revolutionary government – the Armed Forces Movement (MFA) –, which lasted until 1976, when the country held its first free multi-party elections since 1926.

In the aftermath of the revolution, a number of important reforms were introduced. Portugal started a movement of de-colonisation and the role of the state in the economy was increased with the nationalisation of an important part of the economy (most of the heavy industries, financial, insurance and communication sectors), and the expropriation of landed estates in the southern region (the Agrarian Reform – *Reforma Agrária*). The 1976–1984 period was marked by extreme political instability – between the creation of a new Constitution in 1976 until April 1984, Portugal saw the rise and fall of nine constitutional governments – but despite the political alternation, a broad pattern of reversion of the revolutionary changes and of

Table 1. Portugal: students enrolled in primary, secondary and tertiary education (per cent of population from 5 to 24 years).

	Percentage	Primary	Secondary	Tertiary
1930	16.1	94.6	4.1	1.3
1940	20.8	93.5	5.1	1.4
1950	21.9	91.1	7.0	1.9
1960	35.1	86.7	10.9	2.3
1970	39.0	84.2	11.6	4.2
1981	44.4	63.2	31.0	5.8

Source: Mitchell (1998).

creation of a market economy came into place. In the 1980s, several industries that had been previously nationalised were privatised, and the accession to the European Economic Community (EEC) put the country within a firm route towards a capitalist organisation of the economy fully integrated in the world market.

With regard to the nature of economic policy and to the overall evolution of the economy, four main phases are usually distinguished during the period under study.¹⁷ In the first two decades of the regime, Portugal was characterised by the defence of a certain isolation from the exterior, which was reflected in the promotion of the country's self-sufficiency. In the 1930s and 1940s, a strong emphasis was put on agriculture-related activities, the 'Wheat Campaign' being a paradigmatic example, whereas the industrial sector was under heavy regulation through the Law of Industrial Conditioning (*Lei do Condicionamento Industrial*), adopted in 1931. In the mid of the twentieth century, Portugal remained a backward agriculture-dominated country, in which agriculture accounted for more than 50% of total employment and was responsible for about one-third of total output (cf. Table 2). This is a period globally marked by relatively low growth rates, in line with other European countries' experiences, despite the country's neutrality in the Second World War (cf. Table 3).

A second phase corresponds roughly to the 1950s, when the *Estado Novo* progressively changed its economic discourse to the favouring of the country's industrialisation, shifting towards the implementation of measures aimed at the promotion of economic development and structural change.¹⁸

State intervention industrial policies were carried out to stimulate basic industry, such as the First Development Plan, launched in 1953, which were accompanied by protectionist trade policies focused on import substitution. The process of systematic industrialisation of the country takes place precisely in this period, with a substantial delay relative to the general experience of other OECD countries.¹⁹

Table 2. Structure of employment and GDP in Portugal (%)

	Employment 1			GDP (1958 prices)		
	Agriculture	Industry	Services	Agriculture	Industry	Services
1910	61.0	21.7	17.3	37.1	27.1	35.8
1920	60.9	21.2	17.9	30.4	25.8	43.9
1930	60.9	20.7	18.4	31.5	28.0	40.5
1940	57.8	21.0	21.1	30.6	28.7	40.6
1950	53.8	24.6	21.6	32.1	30.3	37.6
1960	43.1	28.2	28.7	27.2	37.0	35.7
1970	27.6	33.9	38.6	15.3	48.8	35.9
1980	19.2	37.7	43.1	10.5	48.8	40.7
1990	13.1	37.3	49.6	10.4	44.6	45.0

Note: Employment shares of 1910 refer to 1911.

Sources: Employment: Lains (2007) for 1911–1950, and Valério et al (2001, p. 164) for 1960–1990. GDP: Lains (2003b) and Lains (2007).

¹⁷See Lains, 'Catching-up' (2003a); Lopes, *Economia Portuguesa* (1996).

¹⁸Marques, *Política Económica* (1988).

¹⁹See Feinstein, 'Structural Change' (1999).

Table 3. Growth of real income per capita in the European periphery and core, 1913–1986 (%)^a.

	Portugal	Spain	Greece	Ireland	Core ^b
1913–1929	1.35	1.65	2.45	0.33	1.39
1929–1938	1.28	–3.53	1.50	0.87	1.16
1938–1950	1.56	1.48	–2.72	0.94	1.00
1950–1973	5.47	5.63	5.99	2.98	3.55
1973–1986	1.52	1.31	1.75	2.47	2.01

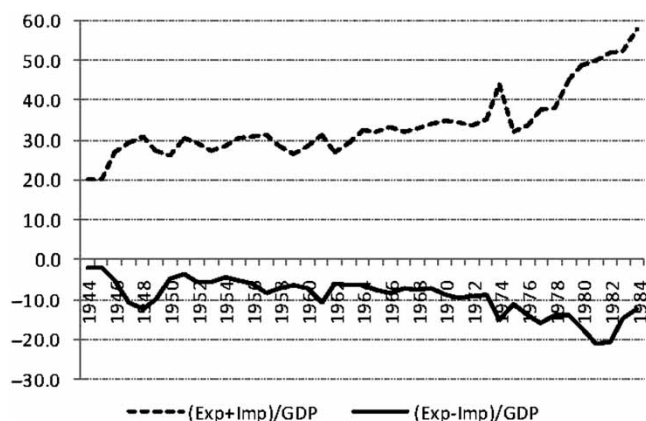
Source: Lains (2003a).

^aMaddison's phases of development; average 3-year annual growth rates.^bNine European forerunners.

Although a more liberal path was established by the end of the 1940s concerning foreign economic relations (Portugal was accepted into the Marshall Plan in 1947, and became a charter member of the OEEC and NATO in 1948 and 1949, respectively), an export-oriented strategy of growth was only embraced in the late 1950s, when Portugal subscribed the European Free Trade Association (EFTA) convention (1960), and became thereafter a member of the General Agreement on Tariffs and Trade (GATT), the IMF, and the World Bank. A third phase is established precisely from this date until the end of the regime in 1974, a period marked by the internationalisation of the economy and by an impressive rate of economic growth.

Between 1960 and 1973, international trade grew considerably, with the country benefiting from the reduction of trade barriers in several Western European countries, which were experiencing rapid growth (cf. Figure 2). The export share in GDP increased from 9% in 1944 to about 14% in 1973, but imports expanded faster, more than doubling its share in the same period, despite the fact that under

Figure 2. External trade and trade balance shares in GDP (% , current prices).



Source: Afonso and Aguiar (2005).

the EFTA agreement Portugal was allowed to enjoy a more gradual removal of its protective tariffs than the other more industrialised member countries. Such an increase in the external sector of the economy had a relevant impact on the country's growth performance, contributing, at the same time, for the impressive changes that took place in the composition of economic activity and employment, namely the growth of the manufacturing sector and the substantial decline of agriculture (cf. Table 2).

Changes in external trade policy during the period under study had also important effects over the composition of exports and imports. Until the 1950s, Portuguese exports were composed mainly of agriculture, forestry and agriculture-related semi-finished industrial products, such as wine and wood products.²⁰ The implementation of industrial policies to stimulate basic industry in the 1950s seems to explain the strong rise in chemicals and rubber and plastic products' exports in that decade, but the major features of Portuguese exports remained practically unchanged. In the 1960s, the gradual removal of trade barriers, which were mostly limited to trade with Portugal's more developed European partners, were reflected in a concentration of exports in products in which the country benefited from comparative advantages. Agriculture-related goods became progressively less important in exports, but given the overall lower level wages and productivity and the relative technological backwardness of the country, the comparative advantages were concentrated in labour-intensive and natural resources-based industries, such as textiles, clothing, footwear, basic metals and electrical machinery (mostly assembly-line production), and wood and paper products. In fact, the most relevant change that took place in Portuguese exports from the 1960s onwards was the decline experienced by food, drink and tobacco products and its replacement as the top export industry by textiles, clothing, leather and footwear (cf. Table 4).

In 1974, growth came to a halt, due to the combined effects of the intense worldwide recession following the 1973 oil price crisis and of the domestic political and economic unrest in the aftermath of the Carnation Revolution. Due to the political change, large sectors of the economy were nationalised (about a quarter of the GNP), a number of land estates were expropriated, and wages skyrocketed. The increase in wages was not enduring, however: in 1978 the real wage index in industry and transports had already returned to the 1973 level.²¹ The unfavourable economic conditions both at the international and domestic levels translated into slower and more irregular growth, and brought about severe external debt problems. The current account declined rapidly, due to the increased international price of oil and the worldwide recession, and also because of the reduction of emigrant workers' remittances and tourism receipts. The strong difficulties in the balance of payments led to the negotiation of two economic stabilisation agreements with the IMF, in 1978–1979 and 1983–1984. A number of austerity measures were then taken as part of the requirements of the letters of intent the government signed with the IMF, which were reflected in the decrease in investment, consumption and output levels,

²⁰cf. INE, *Estatística Agrícola*, chapter 'Comércio Externo e Comércio com as Ilhas', several issues.

²¹Valério et al., *Estatísticas Históricas* (2001), 647.

Table 4. Structure of exports and imports in Portugal (%).

ISIC rev.3		Exports					Imports				
		1944	1950	1964	1974	1984	1944	1950	1964	1974	1984
01–02	Agriculture and forestry	6.5	10.5	5.0	3.6	1.6	24.1	24.1	10.7	12.3	15.3
10–14	Mining and quarrying	2.2	3.5	1.8	1.5	0.6	3.2	2.1	6.9	16.4	26.2
15–16	Food, drink and tobacco	40.5	27.8	23.5	14.3	10.2	13.8	14.1	5.5	6.0	3.8
17–19	Textiles, cloth, leather and footwear	16.8	22.5	21.2	29.4	32.8	10.8	6.3	7.1	5.0	4.1
20	Wood and products of wood	11.1	13.7	17.8	8.7	6.6	0.1	0.2	0.3	0.3	0.3
21	Pulp, paper and paper products	1.1	0.9	2.7	5.8	7.2	6.2	2.4	1.8	1.4	1.3
23–25	Mineral oil refining, coke, chemicals, rubber and plastics	2.4	2.3	13.2	12.1	12.6	12.5	9.8	9.9	11.0	19.0
26	Non-metallic mineral products	6.9	4.2	3.4	2.3	2.9	5.9	1.4	1.2	0.8	0.7
27	Basic metals	4.2	0.6	1.5	1.3	2.5	7.3	6.6	10.9	8.4	4.8
28–35	Fabricated metal products, machinery, electrical and transport equipment	1.7	3.2	4.5	15.9	21.1	9.6	28.7	31.8	28.1	22.9
	Other products	6.6	10.5	5.3	5.1	1.8	6.5	4.3	13.9	10.4	1.5
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Agriculture exports: INE, *Estatística Agrícola*, several issues; industry exports: Afonso and Aguiar (2005).

and in a strong rise in unemployment and inflation rates. The severe constraints imposed by the current account imbalances were only overcome after 1985, period in which the Portuguese economy went through a new phase of intense economic growth, which lasted until 1990.²²

3. Trends in wage inequality

The analysis of wage inequality between skilled and unskilled workers is performed based on a yearly survey conducted by INE, which takes into account all firms with 10 or more employees, and provides information on wages and workers differentiated by economic activity and occupation.²³ Figure 3 presents the evolution of the skilled wage premium between 1944 and 1984 for nine industry sectors, and for their aggregation as a whole, using the number of workers in each sector as weights.

The evidence displayed in Figure 3 suggests that there has been an overall tendency for a slight rise on the relative wage of skilled workers until approximately the mid-1960s, but from this period onwards a marked trend of decline in wage inequality took place, accompanying the transition to democracy, and lasting until the late-seventies.²⁴ The decline in the wages of skilled relative to unskilled workers in this period is found in virtually every industry for which there is available information on the decomposition of wages between the two groups of workers.

Using the whole information available on wages during the period under study, i.e. considering simultaneously wages from agriculture, industry and service activities, there is also evidence of a marked trend of decline in wage inequality from the mid-1960s onwards (cf. Figure 4).

These general findings introduce some aspects of novelty relative to previous evidence on wage inequality in Portugal. Unlike Alvaredo, who found that wage inequality was rather stable between 1964 and 1970, declining afterwards,²⁵ our results indicate that the decline in wage inequality started earlier, about a decade before the transition to the democratic regime, which means that the political change cannot be related to an eventual rise in inequality levels. The difference in the results obtained in both studies is probably due to the fact that our computations take into account the changes in the entire wage distribution, whereas Alvaredo's measures are based solely on top wage concentration.

In the following section, an account is made of the factors explaining the observed wage inequality trends, by assessing the influence of migration and international trade in the process.

²²For an account of the economic and political evolution of Portugal in the later part of the twentieth century see Lains 'Growth' (2007) and Pinto, *Contemporary Portugal* (2003).

²³Appendix 1 provides a detailed description of the data and sources used in the computations. The number of workers and wage levels by skill group are provided in Tables A.1 and A.2.

²⁴The decreasing pattern of wage inequality has been reversed during the first half of the 1980s, increasing until 1995, and showing since then relative stability. See Rodrigues/Albuquerque, 'Pobreza' (2000) and Rodrigues, *Distribuição do Rendimento* (2008).

²⁵Alvaredo, 'Top incomes' (2009).

Figure 3. Portugal: wages of skilled relative to unskilled workers by industry (source: see text).

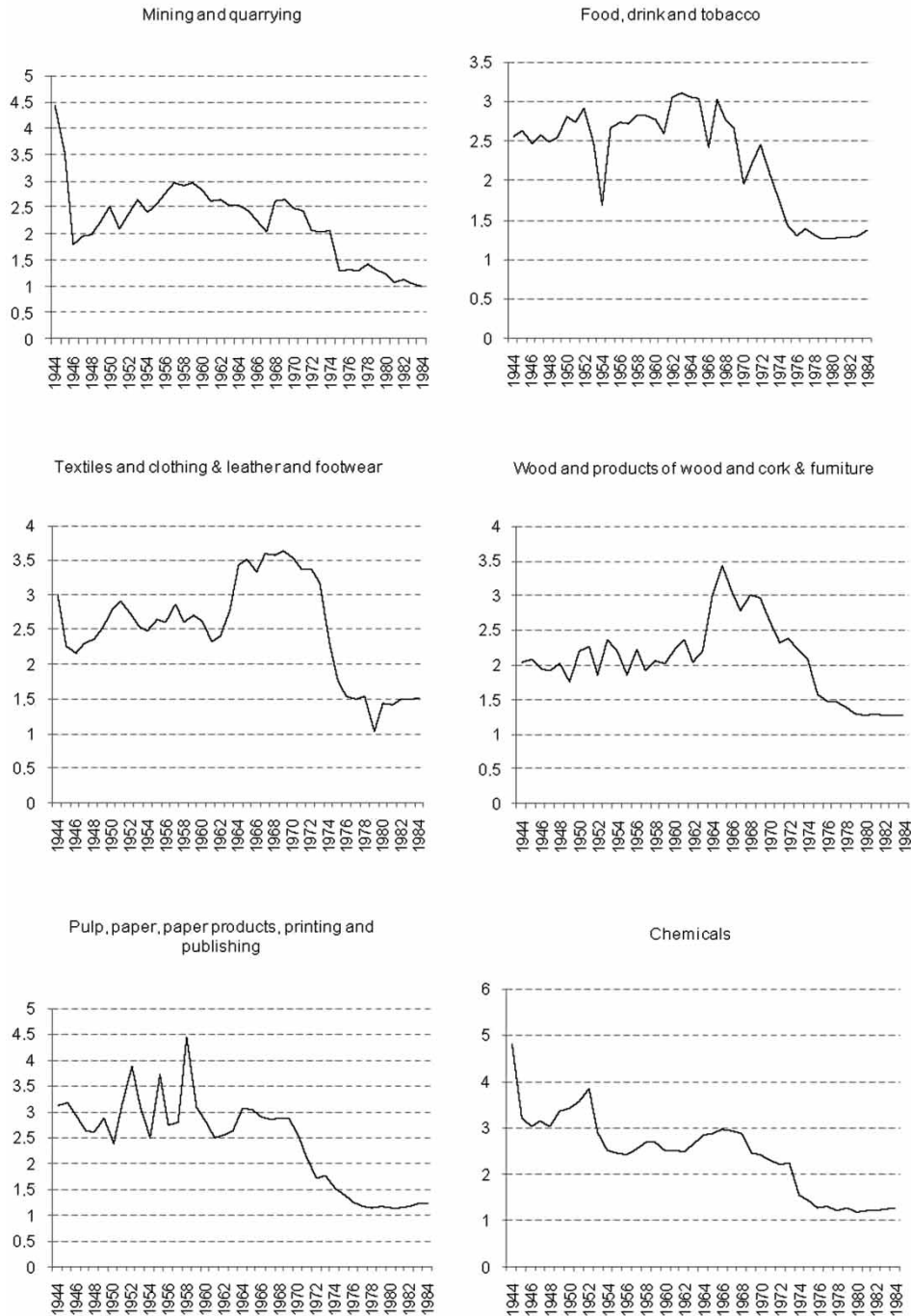
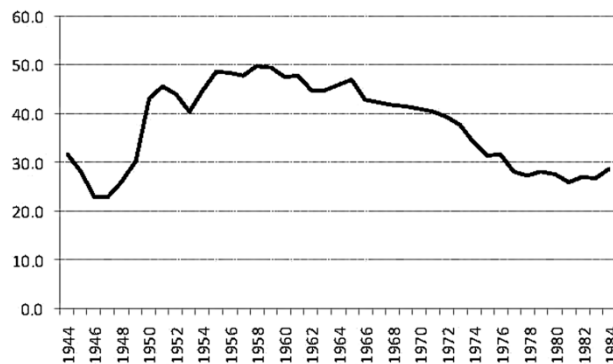


Figure 3b. (Continued).



Figure 4. Coefficient of variation, all sectors.



Source: See Appendix 1.

4. The sources of changes in wage inequality

In line with recent developments in the literature on wage inequality,²⁶ we undertake an analysis of changes taking place in the relative supply and the relative demand of skills, in order to explain the aforementioned inequality trends. The basic framework uses a two-level Constant Elasticity of Substitution production function, in which aggregate output depends solely on the quantities of skilled and unskilled workers, to explain the skill wage differentials. Under the assumption that skilled and unskilled workers are paid their marginal products, a general expression representing a relative demand function can be written as follows:

$$\frac{W_{st}}{W_{ut}} = D \left(\frac{N_{st}}{N_{ut}} \right)^{\frac{-1}{\sigma}} \quad (1)$$

where $\frac{W_{st}}{W_{ut}}$ represents the relative wage in period t , N_{st} and N_{ut} are the quantities supplied of skilled and unskilled workers, respectively, D represents relative demand shifts favouring skilled workers, and σ is the elasticity of substitution between skilled and unskilled labour. The greater is σ , the smaller the impact of shifts in relative supplies on relative wages, and the greater must be the fluctuations in demand shifts to explain the time series variation of relative wages for given time series variation of relative quantities.

Table 5 presents changes in relative supply and relative wages, along with the estimated changes in relative demand, assuming a unitary elasticity of substitution between skilled and unskilled labour.²⁷

During the period under study, there was an overall increase in the relative supply of skilled labour, which grew in about 1.5% a year. The increases in the relative supply of skilled labour were in most years lower than the decreases in the relative wage, meaning that an overall reduction in the relative demand for skilled labour has been in place. In fact, only during the 1950–1964 period was the increase in the relative demand for skilled labour higher than the corresponding increase in supply, which was conducive to an increase in the overall skill premium. After 1964,

Table 5. Growth of relative wages, supply of, and demand for skilled labour in Portugal (annual %).

	Relative supply	Relative wage	Relative demand
1944–1950	0.9	–1.9	–1.0
1950–1964	2.5	1.0	3.5
1964–1974	2.5	–5.6	–3.1
1974–1984	1.6	–4.4	–2.8
1944–1984	1.5	–4.0	–2.5

Source: See Appendix 1.

²⁶Katz/Murphy, ‘Changes’ (1992); Card/Lemieux, ‘Falling Supply’ (2001); Autor et al., ‘Trends’ (2008).

²⁷Such an assumption is also made by Anderson, ‘Globalization’ (2001), 102.

this pattern was again reversed, with an overall decrease of relative demand being found.

4.1. Explaining changes in the relative supply of skilled labour: the role of domestic and international factors

The growth in the relative supply of skilled labour can be related to both the impact of domestic factors, such as the expansion of education, and to the influence of international migration flows. As previously indicated, education was not a priority during the *Estado Novo* period, which was reflected in rather low levels of educational attainment. In the early 1970s, more than one-third of the Portuguese older than 15 were illiterate and almost 60% of the Portuguese councils did not have secondary schools.

In this context, the rise in education levels can hardly be seen as the main factor explaining the fluctuations in supply. Most likely, emigration flows, which were of impressive magnitude – between 1944 and 1984, more than two million Portuguese left the country, with about 35% of the departures taking place clandestinely – had a stronger influence over relative supply (cf. Figure 5). In fact, all the available evidence points to an overall low-skill characterisation of the Portuguese emigration, which was predominantly composed of males in active age with few or no skills.²⁸

Moreover, the periods in which we find the highest increases of the relative labour supply of skilled labour (1950–1964 and 1964–1974) are precisely those in which emigration peaked: between 1964 and 1974, the average annual number of departures was of about 118,000.

One can go a step further and try to determine the impact of emigration over the relative supply and wage of skilled labour between 1944 and 1984. Baganha provides some information on the social and demographic characteristics of emigrants, covering the gender, age, marital status and the sector of economic activity of the

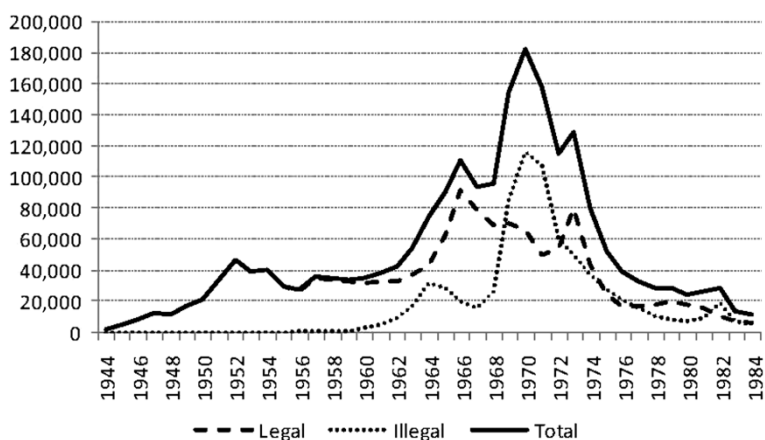


Figure 5. Legal and clandestine emigration.

²⁸See Baganha, 'Correntes Emigratórias' (1994) and 'From Closed to Open Doors' (2003); Silva et al., *Retorno, Emigração* (1984); Ferreira, *Origens e Formas* (1976).

emigrants.²⁹ Under the assumption that, on average, industry is more skill-intensive than agriculture, a classification of skilled and unskilled emigrants can be undertaken, using the information on the economic activity of the emigrant. This allows for an estimation of the impact of emigration on the relative supply of skilled labour, although the accuracy of the results is, of course, rather crude.

The contribution of migrant workers to the relative supply of skilled labour is computed by the ratio:

$$\varphi = \ln \frac{(1 + m_s)}{(1 + m_u)} \quad (2)$$

where m_s and m_u represent the share of skilled (unskilled) emigrants in the corresponding supply (skilled/unskilled) of native workers.³⁰

Table 6 presents the estimates of the contribution of migration flows, summed over the sub-periods indicated, to the relative supply of skilled labour in Portugal at each period end. Computations are made considering legal emigration, and legal plus clandestine emigration, assuming that the employment structure of legal emigrants applies to illegal ones. We also assume a low rate of return of emigrants (20%), since most of the Portuguese emigration during the period under analysis was made on a permanent basis.³¹

Although the applied procedure is rather crude and the time delimitation does not match exactly the one used in Table 5,³² the results seem to indicate that emigration has acted as the main factor influencing the observed trends in relative labour supply. Emigration tended to increase the relative supply of skilled labour, and this increase has been stronger between 1960 and 1979. More precisely, the estimates suggest that the relative supply of skilled labour was about 17% higher in 1969 than it would have been if had there been no emigration over the previous nine years, and a similar figure is obtained in 1979 with respect to the previous decade. Assuming average annual impacts, these figures almost exhaust the entire variation observed in relative labour supply in the 1960s and 1970s.

In sum, and keeping the caveats of the procedure undertaken in mind, one can conclude that the effects of international migration were large; they match

Table 6. Contribution of migration to the relative supply of skilled labour (%).

	Legal emigration	Legal and illegal emigration
1955–1959	1.8	2.3
1960–1969	12.0	17.1
1970–1979	8.2	18.6
1980–1988	0.9	1.5

Source: See Appendix 1.

²⁹Baganha, 'Correntes Emigratórias' (1994).

³⁰cf. Anderson, 'Globalization' (2001).

³¹cf. Baganha, 'Correntes Emigratórias' (1994).

³²The sub-periods indicated are those available from the source and for that reason they do not match exactly the former temporal delimitation.

reasonably the trends in relative labour supply, and seem to account for almost all the variation observed in this variable.

4.2. Changes in the relative demand for skilled labour: the role of international trade

The evidence displayed in Table 5 indicates a sustained decrease in the relative demand for skilled labour during the four decades under study, with the exception of the years between 1950 and 1964. The overall decline in the relative demand is consistent with the general view according to which the demand for unskilled labour increases in periods of high aggregate demand,³³ as was the case of Portugal during most of the period under study, and most particularly between 1960 and 1973, the *golden age* of Portuguese economic growth.³⁴

The reversal of the trend in relative demand for skilled labour in the 1950s and its continuous decline after 1974, a period of slow and irregular growth, seem to indicate, however, that international trade played an important role in the process. More precisely, the increase in relative demand found in the 1950s is in line with the aforementioned characterisation of this period as one marked by the government's pursuit of the country's industrialisation, anchored on the support of heavy industries and on a development strategy based on import substitution. Conversely, the spurt of international trade since the early 1960s may have acted as a major determinant of falling wage inequality, by stimulating the growth of low-skill labour intensive industries, in line with Hecksher–Ohlin–Vanek's predictions.

We investigate this point by using factor-content of trade calculations (FCT), which constitutes the most common approach for studying the impact of trade on the labour market.³⁵ The FCT approach computes the amounts of factors used in producing a country's exports and those involved in the production of its imports. The differences between exports and imports are then seen as the impact of trade on the demand for a particular factor, i.e. the demand of factor f is said to be increased by trade if exports require a larger quantity of this factor than imports.

The general expression representing net trade in embodied services of production factor f , for a country j and summing over sectors $i = 1 \dots n$, is given as follows:

$$\begin{aligned} N_{jf} &= \sum_{i=1}^n X_{ij} a_{ijf} - \sum_{i=1}^n M_{ij} a_{ijf} \\ &= \sum_{i=1}^n X_{ij} \sum_{i=1}^n x_{ij} a_{ijf} - \sum_{i=1}^n M_{ij} \sum_{i=1}^n m_{ij} a_{ijf} \end{aligned} \quad (3)$$

where X_{ij} and M_{ij} are exports (imports) of industry i from (to) country j , x_{ij} and m_{ij} are export and import sectoral shares, respectively, and a_{if} represents the use of factor f per unit of production from industry i .

³³Anderson, 'Globalization' (2001).

³⁴Lopes, *Economia Portuguesa* (1996).

³⁵See Foster/Stehrer, 'Factor Content of Trade' (2010) for a comprehensive survey on factor-content of trade analysis. See also Feenstra, *Offshoring in the Global Economy* (2010) and Maskus/Nishioka, 'Development-related Biases' (2008) for recent applications of the method.

The value of net exports of the services of factor f , in per cent of domestic supply, embodied in goods' trade, is then given as

$$\gamma_{jf} = \frac{\sum_{i=1}^n X_{ij} \sum_{i=1}^n x_{ij} a_{ijf} - \sum_{i=1}^n M_{ij} \sum_{i=1}^n m_{ij} a_{ijf}}{V_{jf}} \quad (4)$$

where V_{jf} is the total supply of factor f in country j .

Table 7 presents the contribution of trade to the relative demand for skilled labour, obtained from the computation of γ for both skilled and unskilled labour in the sub-periods under analysis.

Computations were made using data on trade, output and employment indicated in Appendix 1, and considering the skill requirements by industry described in Table A.2. Ideally, one should use different technological matrixes for exports and imports, the latter providing information about skilled and unskilled labour requirements for Portugal's trading partners.³⁶ The unavailability of such data, however, precluded its use in the present case. A further limitation of the analysis is that it covers only a relatively small number of sectors – 11 sectors, including agriculture – which can also cause a bias in the calculations (Feenstra/Hanson, 2000).³⁷

The estimation of the impact of trade in the sub-periods under analysis is performed assuming that the matrix describing production technology is constant over time, i.e. comparisons between t and $t+k$ are made using the technological matrix of year t . This allows for an estimation of the impact of trade in factor services due solely to changing trade patterns, excluding the influences from technological change.³⁸

The results match rather well the trends of relative demand for skilled labour described in Table 5. According to our calculations, trade decreased the relative demand for skilled labour during most of the period under study, with the exception

Table 7. The contribution of trade to the relative demand for skilled labour (%).

	Total	Annual average
1944–1950	–1.9	–0.3
1950–1964	6.4	0.4
1964–1974	–10.1	–1.1
1974–1984	–4.1	–0.4

Source: See Appendix 1.

³⁶Davis/Weinsten, 'Account of Global Factor Trade' (2001).

³⁷Although skill requirements were not available for agriculture, we decided to keep this sector in the analysis, given its importance in trade during the period under study. To this purpose, we assume agriculture's skill requirements to be similar to those regarding mining and quarrying, an activity which, according to our data, is always less skill-intensive than manufacturing. Anderson's 'Globalization' (1998) computations based on Kuznets and Bairoch's historical statistics of sectoral skill coefficients give some credit to this assumption, given the close proximity between mining and agriculture's figures. We also tested for the elimination of agriculture from FCT computations, but the results did not change significantly.

³⁸As can be seen from the data in the appendix, there has been an overall tendency for an increase in skill intensity over time in all industries under study.

of the years between 1950 and 1964, which, as indicated earlier, were influenced by the adoption of a development strategy of import substitution.

The impact of trade was significant for most of the period, being particularly strong between 1964 and 1974, when the country benefited most from the opening up strategy embraced in the late 1950s. It seems therefore that specialisation in specific manufacturing industries (e.g. textiles, clothing) intensive in low-skill labour has played a role in the decline in the relative demand for skilled labour, more than compensating the effect of skill-biased technological change.

This notwithstanding, the interpretation of the magnitude of the estimates must be made with care, due to the aforementioned limitations of the FCT calculus. The use of a relatively coarse sectoral aggregation, in particular, may have downsized the impact of trade on relative demand, especially in the more recent period, which was marked by an increasing structural complexity of the economy.

All things together, it seems fair to conclude that international trade had a decisive influence on the relative demand for skilled labour and, as such, on overall wage inequality trends.

5. Concluding remarks

The present study provides a quantitative assessment of wage inequality trends in Portugal between 1944 and 1984, based on the changes taking place in the relative supply and the relative demand of skills as measured by wage levels. The computation of relative wages shows that wage inequality went through a marked decline from the early 1960s onwards, about a decade before the country's transition to democracy until at least 1984.

The pattern of a consistent decline in wage inequality found for Portugal is in line with several other countries' experiences during the period under study. Wage inequality measures based on the comparison of wage deciles computed by Atkinson for the USA, UK, France, Germany and Canada, show a rise in wage inequality until the mid-1950s, followed by an overall decline until the late 1960s, which resembles the Portuguese pattern.³⁹ Similar results were obtained by Galbraith and Kum, who found a global tendency of decline in wage inequality in manufacturing activities between 1963 and the late 1970s for a number of countries.⁴⁰ Anderson's (2001) findings show also a long-run tendency of decline in wage inequality in all eight countries under study after 1914, although most of the decline occurs between the late 1930s and the late 1950s.⁴¹

According to our findings, the overall tendency of decline in wage inequality between skilled and unskilled workers was due to a combination of a sustained increase in relative supply of skilled labour with a decrease in the relative demand of this group of workers. With respect to the former, and given the limited expansion of education in the Portuguese case during most of the dictatorship period, interna-

³⁹ Atkinson, *Changing Distribution* (2008).

⁴⁰ Galbraith/Kum, 'Estimating Inequality' (2005).

⁴¹ Contrasting evidence appears with respect to Latin American economies, which show stagnant wage inequality until the 1970s and an increase afterwards [Frankema, 'Latin America', (2009)], and Spain, which shows an inverted W inequality pattern during the twentieth century [e.g., Prados de la Escosura, 'Inequality, Poverty' (2008); Guilera, 'Evolution Wage Inequality' (2009)].

tional migration seems to be the major explaining factor for the observed trends. The impressive outflow of labour force essentially composed of workers with few or no skills has increased substantially the relative supply of skilled labour, which, other things equal, would translate into a declining wage premium of skill workers. The declining wage premium was also the result of the decrease in the relative demand of skilled labour. In this case, although domestic factors had also played a role, given the global increase in the level of aggregate demand, which is generally conducive to the increase on the relative demand for unskilled labour, international trade seems to account for most of the variation occurred in wage inequality. The country's increasing openness to foreign trade was conducive to an increasing demand for low-skill workers and decreasing demand for high-skill workers, due to the country's specialisation in specific manufacturing industries (e.g. textiles, clothing) intensive in low-skill labour. This seems to constitute the main cause for the decline in the relative demand for skilled labour, more than compensating the effect of skill-biased technological change.

In this context, the Portuguese experience seems to be contrasting to that observed in more developed countries, as documented in Anderson's work,⁴² and on a number of studies focusing on the US experience.⁴³ Unlike these countries' experiences, in which the decline in the skill premium seems to be primarily related to domestic forces, our findings indicate that international factors were more important in explaining the overall inequality trends. The extent to which the evidence found for Portugal also applies to other less developed countries during the twentieth century seems to constitute an important topic for future research.

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⁴²Anderson, 'Globalization' (2001).

⁴³See, for example, Goldin/Katz, 'Decline of Non-competing' (1995); Goldin/Katz 'Origins of Technology' (1998); Katz/Murphy, 'Changes' (1992).

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Appendix 1: Data sources.

Wages

Agriculture wages

Data on agriculture daily wages are from the *Anuário Estatístico de Portugal* (1944–1984a) conducted by the Portuguese Statistics Office (INE), chapter *Produção e Consumo* for the 1944–1954 period, chapter *Preços e salários* for the years between 1955 and 1982 and chapter *Emprego e salários* for the remaining years.

Industry wages

Industry wages are also taken from *Anuário Estatístico de Portugal*. The data were collected from a yearly survey conducted by INE, which took into account all firms with 10 or more employees. The data are available in the following chapters: *Produção e Consumo* (1944–1967), *Indústrias extractivas* and *Indústrias transformadoras* (1968–1970), *Rendimentos, salários e preços* and *Mão-de-obra* (1971–1981) and *Emprego e salários* (1982–1984).

The source distinguishes between different types of workers, which constitute the basis for the classification of skilled and unskilled labour used in the computation of wage inequality. Between 1944 and 1955, data on industry wages are provided for three different types of workers: employees (*empregados*), industrial workers (*assalariados industriais*) and other workers (*outros assalariados*). For the 1956–1970 period, data are provided for two occupational groups: employees (*empregados, administrativos, técnicos e de escritório*) and other workers. Between 1971 and 1981, the information on wages is again classified into three distinct groups: *dirigentes, outro pessoal* (both employees) and workers. For 1982–1984, there are only two groups of workers: employees (*dirigentes, administrativos, técnicos e outros empregados*) and workers (*operários*).

According to INE's description of the aforementioned categories, employees are owners with directive responsibilities and a regular remuneration, such as administrators, managers, economists, engineers, technical directors, secretaries, stenographers, typists, accountants, staff in charge of ordinary tasks in laboratories, personnel recruitment and staff of the social services of the company (i.e. clinics, schools, sports and other leisure activities), whereas workers comprise all the personnel who participate directly in the production process, including masters and foremen. Employees are also the workers who possess a longer-term contract, whereas workers earn daily wages. Following INE's categorisation, we consider employees as skilled workers, taking together the other categories in the unskilled workers' group.

Industry wages appear as the total amount paid per year between 1944 and 1970, whereas for the subsequent period, they are provided on a monthly basis for skilled workers and on an hourly basis for unskilled workers. In order to get consistent wage data, all wages have been converted into daily wages. The annual wages of industry branches between 1944 and 1970 were converted to daily wages by dividing the total amount paid per year by the number of workers in each sector, and then by dividing the corresponding outcome by 304 working days.⁴⁴ Monthly wages for skilled workers in industry branches between 1971 and 1984 were converted into daily wages by dividing 25.33 (304 working days divided by 12 months). With respect to the wages of unskilled workers for the same period, the hourly wages were transformed into daily wages by multiplying by a factor of 8, the number of working hours per day.

The number of industrial sectors considered in the survey varied considerably during the time period under analysis. To get homogenous data, the sectoral structure used by Pinheiro (1997) has been taken as reference, and all the information has been aggregated to fit that sectoral decomposition (CAE rev.1). In order to aggregate the different sub-sectors into the

⁴⁴The total of 304 working days per annum was obtained considering a number of six working days per week and deducting the official and religious holidays. The six-day working week was established in 1934 and did not change over the whole period of *Estado Novo* (*Decreto no. 24402*; Patriarca, *A Questão Social no Salazarismo* 1995, 372). During the *Estado Novo*, there were nine days of official and religious holidays per year (Araújo et al., 1969, 207).

Table A.1. Daily wages in current prices (escudos, 1944–1984).

		Mining and quarrying		Food, drink and tobacco		Textiles, clothing leather and foot		Wood, cork and furniture		Print and publishing		Chemicals		Non-metallic mineral products		Basic metals		Electrical and transport equipment		Other manufacturing		EGS	Construction	W retail trade	Transport	Banks	Other services		
		Agriculture	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk							Unsk	
1944	13.85	81.16	18.30	39.11	15.33	33.28	11.14	32.17	15.76	35.52	11.38	62.22	12.91	40.81	15.33														
1945	14.55	71.50	20.22	41.51	15.84	37.97	16.76	34.36	16.61	38.96	12.20	56.61	17.56	43.43	17.74														
1946	17.09	35.76	19.77	47.82	19.34	40.10	18.57	38.52	19.93	46.40	15.79	60.52	19.99	47.82	21.30														
1947	19.12	40.33	20.56	51.84	20.17	45.12	19.68	38.51	20.18	47.21	17.94	65.51	20.82	59.45	24.13														
1948	18.59	43.72	22.12	51.46	20.73	46.73	19.76	40.78	20.13	50.50	19.26	72.02	23.85	60.74	24.37														
1949	18.21	52.83	23.41	54.81	21.56	51.59	20.53	38.54	22.09	54.38	18.91	82.99	24.70	62.67	25.25														
1950	18.06	57.09	22.77	59.37	21.25	55.20	19.88	54.71	24.92	45.65	19.08	90.26	26.40	66.16	25.98								28.98	25.82	36.97	81.55	16.29		
1951	18.40	50.10	23.86	59.61	21.87	58.24	20.06	54.50	24.00	60.55	19.20	97.89	27.38	70.85	24.35									31.49	33.71	43.16	103.62	24.52	
1952	18.63	52.48	22.27	61.44	21.16	60.11	22.13	54.09	29.32	63.54	16.38	98.04	25.53	75.95	25.90										27.73	31.44	41.14	92.02	20.47
1953	18.79	72.13	27.23	50.36	20.42	56.63	22.32	58.43	24.73	67.00	21.50	74.20	25.57	73.55	25.98	42.84	62.83	30.05	25.88	17.65	19.09	51.67	28.89	31.29	39.82	91.34	21.65	30.61	
1954	19.02	63.54	26.32	43.26	25.56	54.77	22.12	55.69	25.20	49.24	19.75	72.38	28.63	74.31	27.48	43.80	63.24	28.66	26.13	20.57	18.15	60.27	33.13	33.76	47.78	105.68	23.05	21.05	
1955	19.28	69.38	27.19	59.05	22.21	63.38	24.02	61.58	33.06	73.35	19.67	66.97	27.25	78.02	26.01	44.13	61.03	28.60	26.06	16.50	18.41	60.42	33.91	33.58	55.63	108.26	21.55	34.55	
1956	19.53	77.39	27.86	64.41	23.57	62.71	24.17	58.36	26.30	61.54	22.40	69.49	28.61	79.87	28.04	47.11	70.90	30.72	26.25	47.70	19.85	64.26	37.08	36.68	57.19	108.19	22.77	32.83	
1957	19.88	85.70	28.91	66.46	24.45	69.88	24.33	60.27	31.32	63.08	22.57	77.02	30.23	85.59	28.75	46.07	71.50	31.63	27.30	26.54	19.45	62.67	40.20	37.06	56.73	117.33	26.72	36.92	
1958	20.84	88.42	30.24	69.29	24.65	63.94	24.58	61.22	29.83	107.73	24.15	81.38	30.12	87.28	30.30	90.61	97.12	40.57	34.28	27.35	19.27	69.98	34.77	40.78	59.52	120.79	27.44	37.44	
1959	22.01	91.34	30.87	71.77	25.47	67.44	24.98	61.66	30.49	78.46	25.18	84.86	31.59	99.17	32.98	105.07	99.84	43.07	43.78	29.00	19.79	75.85	39.99	44.58	61.14	129.64	30.67	38.55	
1960	23.94	93.70	32.91	75.99	27.41	69.33	26.51	66.88	30.11	75.16	26.86	82.60	32.92	94.63	34.73	98.43	100.33	43.86	46.64	35.56	20.50	78.73	39.62	46.90	61.93	136.21	32.83	34.55	
1961	26.13	91.98	35.03	72.22	27.89	69.31	29.89	86.69	36.75	78.22	31.04	88.83	35.11	91.72	35.74	107.01	99.87	47.12	50.14	39.84	23.08	81.75	42.57	50.40	68.09	153.43	34.55	38.55	
1962	30.81	92.98	35.03	91.60	30.01	72.49	30.32	66.37	32.46	84.98	33.19	93.84	37.53	102.93	38.22	122.58	103.35	47.03	51.05	42.94	24.22	88.75	42.11	49.37	73.72	151.27	36.91	46.92	
1963	32.39	96.60	37.90	96.54	31.11	86.52	31.18	75.01	34.14	96.81	36.77	101.93	38.33	109.74	40.11	139.58	110.11	62.56	54.12	60.04	25.61	95.29	43.95	59.40	78.11	156.18	42.16	42.91	
1964	35.78	102.19	40.22	104.06	34.09	117.24	34.11	105.42	34.88	118.99	38.75	117.98	41.54	128.31	41.94	158.18	102.24	69.69	56.33	89.94	26.75	102.40	49.86	79.37	83.19	165.58	47.07	47.07	
1965	39.33	108.96	44.84	111.43	36.79	138.41	39.43	126.18	36.68	133.93	43.78	129.70	44.90	137.52	42.62	181.74	139.08	68.83	57.91	79.52	29.63	115.88	53.26	77.22	89.74	190.89	51.96	51.96	
1966	44.65	110.62	49.35	98.19	40.83	142.82	42.96	131.88	43.24	143.20	49.03	144.58	48.54	168.33	58.03	137.00	156.01	54.15	64.32	117.23	39.24	120.14	63.53	83.05	99.08	187.70	56.93	56.93	
1967	48.98	110.16	53.75	138.02	45.66	160.47	44.75	146.61	52.55	155.37	54.17	163.92	55.95	165.61	57.21	206.50	171.12	78.68	69.02	108.39	36.73	128.77	71.59	91.80	106.69	198.48	66.02	66.02	
1968	57.58	166.97	63.83	139.85	50.67	165.57	46.30	153.88	50.94	144.96	50.14	167.76	58.45	176.41	57.44	220.15	183.72	83.91	74.35	136.89	39.70	144.33	74.26	97.47	105.68	221.67	72.38	72.38	
1969	61.36	188.15	71.09	149.06	55.96	171.94	47.31	168.87	56.82	152.88	53.07	172.93	70.09	178.72	67.01	284.86	192.34	101.85	81.27	131.50	49.45	167.10	81.47	105.71	118.44	230.66	77.77	77.77	
1970	71.11	216.44	86.48	180.03	91.90	188.70	53.44	158.27	60.20	202.31	80.16	202.79	83.87	198.59	61.55	293.17	172.47	136.99	104.09	158.13	53.56	202.24	96.76	118.86	135.82	275.24	86.90	86.90	
1971	82.67	214.51	88.23	172.57	77.65	210.56	62.31	165.68	71.21	212.38	101.00	245.34	106.07	240.58	91.92	319.70	260.35	165.51	119.20	171.92	63.89	220.92	96.57	134.66	148.72	286.38	96.32	96.32	
1972	89.58	215.15	104.36	206.25	84.46	236.56	70.20	190.39	80.19	216.30	125.60	270.97	121.98	270.90	106.60	294.82	291.54	195.91	136.18	189.12	78.81	260.23	113.73	150.15	184.97	300.04	112.48	112.48	
1973	102.03	243.10	119.00	216.00	104.62	273.13	86.09	211.84	94.97	250.69	140.33	322.08	142.95	298.69	120.15	317.17	351.18	158.48	161.35	226.50	93.01	313.52	137.97	174.22	174.47	333.18	127.26	127.26	
1974	131.44	318.33	153.70	286.00	162.29	305.69	133.27	287.96	138.84	316.72	207.62	405.15	260.47	344.20	183.62	408.52	420.63	284.92	263.24	300.09	133.62	426.40	198.14	231.81	291.44	428.55	183.05	183.05	
1975	154.94	365.83	283.30	347.60	243.24	369.94	210.13	319.10	203.27	398.29	286.03	476.86	335.05	413.14	255.38	433.41	527.04	343.24	351.55	387.11	248.80	529.83	257.23	291.13	403.97	511.34	241.45	241.45	
1976	162.77	403.98	304.38	389.39	299.66	402.53	261.83	353.23	239.96	430.81	344.08	513.07	403.13	440.40	309.77	477.86	529.72	461.06	444.83	446.74	252.80	615.02	287.43	324.48	443.81	514.43	252.14	252.14	
1977	187.11	467.33	358.97	491.14	353.55	463.74	309.65	390.37	267.31	482.43	410.28	607.94	465.22	528.08	401.94	649.89	614.08	498.35	512.39	528.66	276.80	370.26	337.34	372.59	487.38	501.74	295.33	295.33	
1978	216.52	553.32	386.10	556.20	423.49	534.82	349.73	450.81	324.00	557.20	484.06	666.26	544.43	608.49	408.50	746.68	639.56	618.80	570.91	609.18	350.40	411.07	385.23	425.10	536.94	568.26	325.14	325.14	
1979	262.00	664.03	505.77	653.93	519.49	635.72	622.80	476.84	369.45	692.02	590.97	853.59	669.59	702.14	531.45	992.62	817.41	771.36	688.31	739.87	424.00	559.51	437.91	489.85	606.28	663.08	383.30	383.30	
1980	306.42	818.39	662.77	751.18	595.87	740.71	515.80	602.68	475.89	850.66	735.60	963.71	812.51	795.06	659.31	909.14	929.29	932.01	838.76	763.47	531.20	600.80	540.35	584.93	794.01	722.96	459.99	459.99	
1981	416.65	970.64	890.78	894.14	704.12	885.38	629.71	741.59	577.14	1005.86	875.47	1197.14	985.28	963.38	802.81	1224.21	1204.12	1094.48	1012.53	852.27	618.40	797.20	687.38	732.78	954.86	925.41	563.87	563.87	
1982	521.49	1248.76	1096.98	1084.11	852.10	1080.26	728.38	874.19	690.82	1228.61	1039.78	1437.33	1195.80	1222.25	989.31	1714.20	1385.50	1362.10	1197.34	1105.41	710.40	1122.46	10231						

Table A.2. Number of workers (1944–1984).

			Mining and quarrying		Food, drink and tobacco		Textiles, clothing, leather and foot		Wood, cork and furniture		Pulp, paper, and print		Chemicals		Non-metallic mineral products		Basic metals		Electrical and transport equipment		Other manufacturing										
	Agriculture	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	Sk	Unsk	EGS	Constr	W retail trade	Transport	Banks	Other services		
1944	880.082	1.424	23.413	5.930	47.933	12.034	147.592	2.581	58.325	987	13.988	2.826	21.159	1.258	16.168																
1945	887.453	1.650	23.530	6.030	48.289	12.233	148.955	2.641	59.683	1.014	14.228	2.899	21.255	1.307	16.552																
1946	893.556	1.913	23.954	6.138	49.070	12.079	152.284	2.763	62.427	1.086	14.688	3.019	21.556	1.396	17.359																
1947	899.658	2.050	24.504	6.288	49.860	12.451	155.184	2.888	65.250	1.168	15.172	3.327	21.668	1.464	18.215																
1948	908.298	1.990	25.289	6.718	50.370	13.329	157.628	3.015	68.126	1.192	15.714	3.525	21.975	1.548	19.056																
1949	914.219	1.911	26.093	7.226	50.801	12.720	161.584	3.143	71.029	1.370	16.135	3.784	22.222	1.724	19.805																
1950	920.080	1.805	26.733	7.649	50.860	12.226	164.538	3.248	73.149	1.600	16.571	4.248	23.693	1.919	20.593																
1951	912.528	1.717	27.127	7.677	50.858	11.274	167.114	3.686	74.101	1.868	17.068	4.985	26.322	2.134	21.417																
1952	903.162	1.411	27.508	7.328	50.826	11.024	168.176	3.403	74.969	1.785	17.983	5.784	30.320	2.099	22.551																
1953	894.643	1.347	27.095	7.151	51.977	10.851	166.420	2.902	74.940	1.850	18.787	6.293	32.759	2.108	23.947	2.982	33.719	2.746	31.838	171	4.377	9.820	124.734	114.080	101.123	19.953	474.279				
1954	885.194	1.250	26.587	6.866	53.914	10.072	166.175	2.169	76.344	1.788	19.975	6.709	33.892	2.130	26.160	2.892	33.660	3.141	33.216	194	4.435	10.325	129.662	118.829	101.671	20.555	471.336				
1955	876.366	1.403	26.750	6.991	56.212	9.974	164.227	2.218	78.749	1.950	21.008	6.934	34.079	2.372	29.113	3.041	35.752	3.444	35.426	288	4.439	11.335	140.499	124.999	102.126	21.363	469.004				
1956	867.395	1.437	27.845	6.982	57.982	8.832	165.342	2.609	82.100	1.953	21.760	7.794	34.511	2.605	32.338	3.304	38.973	3.447	38.681	327	4.441	11.958	155.189	132.643	102.973	22.085	468.869				
1957	857.523	1.500	28.133	7.244	59.552	8.432	164.608	2.823	83.051	1.982	21.852	8.634	35.561	2.892	35.485	3.817	40.583	4.585	41.694	370	4.476	12.921	172.319	139.023	105.181	22.860	471.875				
1958	848.284	1.475	26.710	7.502	60.543	8.575	163.783	2.994	82.058	1.978	21.823	9.864	37.122	3.266	38.940	351	2.094	8.818	83.914	363	4.608	13.918	184.856	144.788	107.892	23.770	475.354				
1959	838.778	1.584	24.586	7.991	60.500	9.217	164.245	3.065	81.468	2.114	21.963	11.098	38.253	3.887	42.975	410	2.070	9.476	87.264	470	4.784	14.340	195.041	151.313	110.271	24.777	478.220				
1960	815.129	1.532	22.501	8.599	60.205	9.852	166.286	3.499	84.380	2.403	22.353	12.042	38.297	4.443	46.250	464	2.210	11.048	90.188	628	5.376	15.074	202.189	158.129	113.603	25.831	478.554				
1961	769.078	1.499	20.211	8.835	60.379	10.484	169.463	4.342	91.396	2.704	22.856	12.760	37.337	4.897	48.149	510	3.457	11.958	94.389	799	6.033	15.725	204.501	168.048	116.337	26.757	479.858				
1962	730.297	1.257	18.433	8.993	61.411	11.027	174.373	5.309	99.398	2.950	24.294	13.070	36.839	5.130	48.637	505	4.164	13.033	98.094	857	6.475	16.140	201.957	179.371	117.929	27.769	485.139				
1963	697.428	1.227	17.337	9.192	63.262	11.727	184.500	6.019	105.704	3.228	25.891	13.656	37.378	5.360	48.752	3.795	17.147	12.651	87.701	839	6.523	16.430	199.275	191.375	118.653	29.114	493.856				
1964	664.054	1.210	16.989	10.037	66.116	12.757	200.946	6.170	107.666	3.541	27.765	13.999	39.144	5.686	49.559	3.560	18.119	16.777	100.596	876	6.557	16.749	206.892	203.979	119.620	30.909	504.707				
1965	629.338	1.220	16.726	11.707	69.144	14.268	218.280	6.410	107.383	3.871	29.469	14.281	41.088	6.074	51.256	2.548	12.933	16.529	109.008	1.050	6.772	16.714	221.254	218.660	121.877	33.151	519.584				
1966	594.082	1.210	16.581	12.566	72.468	15.436	230.708	6.753	106.492	4.291	30.744	14.450	42.233	6.462	52.726	2.568	13.902	18.667	119.322	1.178	7.005	17.158	232.172	235.202	124.401	35.797	537.985				
1967	561.074	1.369	16.356	13.374	75.162	15.612	237.905	7.547	104.736	4.662	32.003	14.673	42.381	6.694	52.896	3.196	16.767	19.972	122.809	1.215	7.209	17.985	234.257	250.776	128.618	39.110	559.790				
1968	531.009	1.558	16.039	13.720	77.642	16.344	241.632	7.976	102.383	4.957	33.098	15.107	42.221	6.918	51.834	3.073	17.515	21.366	125.536	1.258	7.325	18.282	234.854	263.729	134.952	43.523	584.247				
1969	500.820	1.732	15.514	14.732	78.284	17.072	243.139	7.871	98.932	5.335	34.361	15.803	42.809	7.077	50.689	2.976	16.785	24.275	129.852	1.395	7.350	18.258	240.728	274.435	141.619	48.638	614.602				
1970	469.935	1.487	15.306	15.538	77.478	18.901	243.945	8.155	95.646	5.950	35.172	16.931	43.645	7.382	49.710	3.546	18.387	25.526	137.438	1.504	7.501	17.782	257.435	285.037	147.395	53.694	639.045				
1971	441.317	1.238	15.064	15.502	76.277	19.695	247.712	8.687	94.301	7.583	34.721	18.189	44.200	7.545	49.488	1.904	12.976	23.762	156.332	1.555	7.810	17.604	280.753	297.649	151.032	58.306	655.939				
1972	416.611	1.075	15.399	15.537	75.094	21.049	256.143	9.453	94.168	9.082	34.542	19.139	44.611	7.757	50.064	3.158	27.107	23.240	151.138	1.589	8.240	17.779	303.343	313.288	153.517	63.310	661.261				
1973	394.447	1.181	15.745	15.702	74.417	22.418	261.252	9.369	93.827	10.491	34.153	19.817	44.427	7.894	50.324	3.175	28.182	23.620	157.442	1.667	8.511	17.500	309.152	324.865	154.967	68.398	676.345				
1974	376.205	1.267	16.083	16.032	73.865	23.348	264.215	9.932	93.356	10.702	34.475	19.908	44.711	7.965	50.431	2.875	27.969	25.439	160.350	1.692	8.675	17.924	309.516	330.834	155.293	71.265	682.683				
1975	368.463	1.142	14.686	15.012	74.471	22.606	244.736	8.983	88.585	9.886	34.164	15.973	46.903	6.820	50.981	3.604	32.821	26.016	154.100	1.713	8.468	18.051	296.106	319.195	162.264	71.333	684.106				
1976	342.408	1.090	13.165	14.294	71.609	21.979	240.932	8.896	84.343	8.308	30.161	14.652	46.126	7.184	51.349	2.366	23.698	27.849	157.246	1.265	6.410	17.962	281.864	304.878	164.474	68.519	680.447				
1977	308.026	1.043	12.989	13.464	75.054	22.303	240.776	8.871	83.911	7.844	27.816	16.463	53.824	7.172	55.396	2.235	23.387	27.790	159.936	1.776	9.132	20.353	294.323	308.087	170.649	72.159	711.093				
1978	295.019	966	14.051	14.853	79.941	22.336	247.000	9.644	87.127	9.908	34.600	17.628	56.909	7.599	57.337	2.538	25.306	29.987	164.275	1.822	9.619	22.656	310.596	325.258	183.285	78.586	732.517				
1979	283.512	1.156	15.041	16.055	82.172	22.955	255.374	10.896	88.122	11.719	39.843	18.202	58.123	7.633	55.612	2.838	26.365	31.171	167.032	1.824	9.457	24.283	314.721	334.838	186.724	83.313	762.692				
1980	272.792	1.217	15.940	17.984	83.465	23.579	261.762	10.828	90.137	12.519	41.965	20.102	60.234	7.954	56.132	3.775	27.125	33.565	167.951	1.772	9.919	26.714	357.213	345.789	184.729	89.961	761.705				
1981	249.453	1.221	15.254	18.607	80.913	23.871	263.352	10.802	86.644	12.027	37.277	18.178	53.290	8.111	55.607	3.717	26.390	34.400	168.957	1.751	8.305	28.225	379.775	3							

reference sectors, sectoral wages have been weighted according to the number of workers in each sub-sector.

Services wages

Data on wages of service activities are from *Estatísticas das Sociedades* (1950–1984b; INE, several issues). This source provides information on the total amount of wages paid per year in several services branches since 1950 (15 sectors until 1952 and 21 sectors from 1952 to 1984). Daily wages for services are estimated by dividing the total wages paid per year by the number of workers in each sector, and by dividing the outcome per 304 working days. The number of service sectors considered in the source has been aggregated to fit CAE rev.1. The process of aggregation took into account the relative importance of employment in each subsector.

Domestic supply by occupation

INE's Anuário Estatístico de Portugal: chapters: Produção e Consumo (1944–1967), Indústrias extractivas and Indústrias transformadoras (1968–1970), Rendimentos, salários e preços and Mão-de-obra (1971–1981) and Emprego e salários (1982–S1984).

Total employment and sectoral employment

Employment data for the period after 1953 is from Pinheiro (1997), Parte V, *Trabalhadores por conta de outrém*, which were extrapolated backwards on the basis of the growth rate of labour force by sectors given by Valério (2001, Tables 4.6 and 4.7), which are taken from Nunes (1989).

Emigration flows

Data on the number of emigrants and their occupations are taken from Baganha (1994).

International trade shares

INE, Estatística Agrícola, several issues and Afonso and Aguiar (2005).

Output

Data on value added by sector on the period after 1953 is from Pinheiro (1997), which were extrapolated backwards on the basis of the growth rates of output by sectors given by Valério (2001).